**Adrenoleukodystrophy:**

Leuko🡪 white referring to myelin

Dystrophy 🡪 abnormal development

Occur at around ages 3 to 12 🡪 death occurs within acouple years after symptoms

1. Major Symptoms (symptoms similar to Zellweger’s Syndrome):
   1. often misdiagnosed as ADHD in children and MS in adults
   2. Accumulation of saturated very-long chain fatty acids in brain and adrenals
   3. Increase in plasma VLCFAs
   4. Increased levels of VLCFAs in prenatal diagnosis using amniocentesis and chorionic villi sampling
   5. Dementia
   6. Loss of vision
   7. Loss of hearing
   8. Loss of speech
   9. Loss of ambulation
      1. All due to solubilization and removal of myelin sheath
         1. Due to build up of very-long chain saturated fatty acids
            1. 24-26 carbons long
2. Mechanism of Accumulation of very Long Chained Fatty Acids:
   1. Due to poor beta oxidation of very long-chain fatty acids in peroxisomes
   2. Malfunction in transport protein
      1. This transport protein moves Very-Long Chain Fatty Acid-coA Synthase into the peroxisome (ABCD1)
      2. Member of the ABC transporter family
   3. X-Linked recessive inheritance
   4. Limitation of these VLCFAs would not be effective due to synthesis by the ER
3. Feeding a Mixture of unsaturated fatty acids (Oleic and erucic acids) and benefits:
   1. If feeding a mixture of erucic acid and oleic acid (1:4) these unsaturated fatty acids may reduce the levels of very-long chain fatty acids competitively inhibiting the elongation enzyme in the ER
      1. This creates very long-chain unsaturated fatty acids
      2. This may potentially bring the very-long chain saturated fatty acid levels back to normal at least for a while
      3. It is also thought that this would not have much of an affect due to the inability of erucic acid to penetrate the blood brain barrier which would still cause accumulation of very-long chain fatty acids in neurons
   2. A definitive cure does not yet exist
   3. Adrenal Hormone replacement therapy (combined with a)
   4. Hematopoetic stem cell transplantation
      1. Long-term benefit in inflammatory cerebral forms